



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE

United States Patent and Trademark Office

Address: COMMISSIONER FOR PATENTS

P.O. Box 1450

Alexandria, Virginia 22313-1450

www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/659,006	09/09/2003	Christopher H. Bajorek	M3210.X1	3505
35219 7590 07/20/2009 WESTERN DIGITAL TECHNOLOGIES, INC. ATTN: LESLEY NING 20511 LAKE FOREST DR. E-118G LAKE FOREST, CA 92630				
EXAMINER DANIELS, MATTHEW J				
ART UNIT		PAPER NUMBER		
1791				
MAIL DATE		DELIVERY MODE		
07/20/2009		PAPER		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.



UNITED STATES PATENT AND TRADEMARK OFFICE

Commissioner for Patents  
United States Patent and Trademark Office  
P.O. Box 1450  
Alexandria, VA 22313-1450  
[www.uspto.gov](http://www.uspto.gov)

**BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES**

Application Number: 10/659,006  
Filing Date: September 09, 2003  
Appellant(s): BAJOREK, CHRISTOPHER H.

---

James M. Howard  
For Appellant

**EXAMINER'S ANSWER**

This is in response to the appeal brief filed 20 April 2009 appealing from the Office action mailed 22 January 2009.

**(1) Real Party in Interest**

A statement identifying by name the real party in interest is contained in the brief.

**(2) Related Appeals and Interferences**

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

**(3) Status of Claims**

The statement of the status of claims contained in the brief is correct.

**(4) Status of Amendments After Final**

No amendment after final has been filed.

**(5) Summary of Claimed Subject Matter**

The summary of claimed subject matter contained in the brief is correct.

**(6) Grounds of Rejection to be Reviewed on Appeal**

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

**WITHDRAWN REJECTIONS**

The following grounds of rejection are not presented for review on appeal because they have been withdrawn by the examiner:

(a) Rejection of Claims 1-4, 8, 11, 14, 15, 18, and 25 under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Tan (J. Vac. Sci. Technol. B 16(6) Nov/Dec 1998, pp. 3926-3928).

(b) Rejection of Claims 5 and 6 under 35 U.S.C. 103(a) as obvious over Tan (J. Vac. Sci. Technol. B 16(6), Nov/Dec 1998, pp. 3926-3928) in view of Chou (USPN 5956216).

(c) Rejection of Claim 7 under 35 U.S.C. 103(a) as being unpatentable over Tan (J. Vac. Sci. Technol. B 16(6), Nov/Dec 1998, pp. 3926-3928) in view of Chou (USPN 5956216), and further in view of Chou (USPN 6309580).

(d) Rejection of Claims 10, 12, 13, and 16 under 35 U.S.C. 103(a) as obvious over Tan (J. Vac. Sci. Technol. B 16(6), Nov/Dec 1998, pp. 3926-3928).

(e) Rejection of Claim 9 under 35 U.S.C. 103(a) as obvious over Tan (J. Vac. Sci. Technol. B 16(6), Nov/Dec 1998, pp. 3926-3928) in view of Heidari (J. Vac. Sci. Technol. B 18(6), Nov/Dec 2000, pp. 3557-3560).

(f) Rejection of Claim 19 under 35 U.S.C. 103(a) as obvious over Tan (J. Vac. Sci. Technol. B 16(6), Nov/Dec 1998, pp. 3926-3928) in view of Schneider (Applied Physics Letters, Vol. 77, No. 18, October 2000, pp. 2909-2911).

(g) Rejection of Claim 22 under 35 U.S.C. 103(a) as obvious over Tan (J. Vac. Sci. Technol. B 16(6), Nov/Dec 1998, pp. 3926-3928) in view of Davis (2002/0025408).

(h) Rejection of Claim 23 under 35 U.S.C. 103(a) as being unpatentable over Tan (J. Vac. Sci. Technol. B 16(6), Nov/Dec 1998, pp. 3926-3928) in view of Chou (USPN 5956216), Chou (USPN 6309580), and further in view of Chen (USPN 4786564).

(i) Rejection of Claim 24 under 35 U.S.C. 103(a) as being unpatentable over Tan (J. Vac. Sci. Technol. B 16(6), Nov/Dec 1998, pp. 3926-3928) in view of Chou (USPN 5956216), Chou (USPN 6309580), Chen (USPN 4786564), and further in view of Davis (2002/0025408).

(j) Rejection of Claim 25 under 35 U.S.C. 112, first paragraph, as based on a disclosure which is not enabling in view of the omission of essential subject matter (See page 3 of the Final Rejection mailed 22 January 2009).

**(7) Claims Appendix**

The copy of the appealed claims contained in the Appendix to the brief is correct.

**(8) Evidence Relied Upon**

20020025408	DAVIS	2-2002
5,956,216	CHOU	9-1999
6,309,580	CHOU	10-2001
4,786,564	CHEN ET AL.	11-1988

Krauss, P.A., Nanostructure Engineering: Quantized Magnetic Disk and Nanoimprint Lithography, Doctoral Dissertation, University of Minnesota (September 1997), 143 pages.

Colburn, M.T., B.J. Bailey, J.G. Ekerdt, S.V. Sreenivasan, C.G. Willson, Development and advantages of step-and-flash lithography, Solid State Technology (July 2001), pages 67, 68, 71, 73-76, and 78.

**(9) Grounds of Rejection**

The following ground(s) of rejection are applicable to the appealed claims:

***Claim Rejections - 35 USC § 102***

**Claims 1, 2, 8, and 25** are rejected under 35 U.S.C. 102(b) as being anticipated by Krauss (Ph.D. Dissertation, University of Minnesota, 1997).

**As to Claim 1**, Krauss teaches a method, comprising:

heating a stamper and a resist film (page 82, lines 17-21), wherein the stamper is flat (page 80);

imprinting the stamper into the resist film (pages 82-84);  
separating the stamper from the resist film before the resist film is cooled below approximately a glass transition temperature of the resist film (page 83, lines 10-12); and  
cooling the resist film below the glass transition temperature after the separating (inherent). **As to Claims 2 and 8**, Krauss provides both the stamper and single resist layer (PMMA) heated to the glass transition temperature (pages 82-83). **As to Claim 25**, since Krauss teaches a temperature range which is the same temperature range as the claimed invention and teaches all other limitations required by instant Claim 1, it would have been inherent that the same result is achieved.

*Claim Rejections - 35 USC § 103*

**Claims 3, 4, 10, 11, 12 and 13** are rejected under 35 U.S.C. 103(a) as obvious over Krauss (Ph.D. Dissertation, University of Minnesota, 1997). Krauss teaches the subject matter of Claims 1 and 2 above under 35 USC 102(b).

**As to Claims 3 and 4**, although Krauss does not expressly teach a wafer or a trench/plateau pattern used with the resist described in the rejection of Claim 1, these aspects of the invention would have been obvious additions to the Krauss process. For example, Krauss teaches a wafer with the resist on page 87 and trenches and plateaus on page 91. **As to Claim 10**, Krauss teaches heating prior to imprinting (page 82), and any order of heating the two components prior to the imprinting process would have been obvious. **As to Claims 11 and 12**, Krauss teaches heating to the glass transition temperature (pages 82-83). Although Krauss is silent to the number of heating devices, and thus heating the stamper and resist separately,

heating the two components separately would merely separate two process steps already disclosed by Krauss. Separation of parts or steps would have been obvious to the ordinary artisan practicing the Krauss method. **As to Claim 13**, it is submitted that any step of imprinting would obviously require placement of the stamper in close proximity to the resist in order that it is subsequently imprinted.

**Claims 1, 2, 8, 11, 12, 18, 22, and 25 rejected under 35 U.S.C. 103(a) as obvious over Davis (2002/0025408).**

**As to Claim 1**, Davis teaches a method comprising:  
heating a stamper and a resist film ([0073] and [0074]);  
imprinting the stamper into the resist film ([0076]);  
separating the stamper from the resist film ([0076]);  
cooling the resist film after separating (inherent in that other operations are subsequently performed).

Davis does not explicitly teach “separating the stamper from the resist film before there is any substantial cooling of the resist film”. However, this limitation would have been *prima facie* obvious over Davis’ teachings regarding the mold and resist temperatures.

Regarding the mold, Davis teaches that the mold temperature can be above the glass transition temperature of the material to be embossed ([0073], lines 8-10), preferably within 30C above the glass transition temperature ([0073], lines 10-13), and most preferably within about 10C above the glass transition temperature ([0073]), line 14. Furthermore, by *maintaining* the mold slightly above the glass transition temperature and separately heating the substrate to

greater than the glass transition temperature, the embossing cycle time can be reduced by orders of magnitude ([0078]).

Regarding the resist, Davis teaches that the substrate is heated to a temperature between about 5 C or less above the glass transition temperature for crystalline material, and greater than about 5 C above the glass transition temperature for amorphous materials ([0073]). Furthermore, Davis teaches that the substrate can be *maintained* or changed as necessary to enable substrate release ([0075], lines 3-7).

Because the mold is maintained within about 10C above the glass transition temperature and the resist is at a temperature substantially similar to the glass transition temperature (5C or less above the T<sub>g</sub> if crystalline, more than 5C above the T<sub>g</sub> if amorphous, [0074]), there would not be any substantial cooling of the resist film before separation. Additionally, Davis teaches that the particular temperatures of both the mold and resist represent result-effective variables that should be optimized in order to (1) optimize replication, (2) enable substrate release from the mold, and (3) maintain the integrity of the surface features. Thus, the temperatures of both mold and resist represent result effective variables that should be optimized. See MPEP 2144.05 II and *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). **As to Claim 2**, see [0073], [0077], [0074], [0078]. **As to Claim 8**, see [0077]. **As to Claims 11 and 12**, see [0073] and [0074]. **As to Claim 22**, see [0053]).

**Claims 3-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Davis (2002/0025408) in view of Chou (USPN 5956216). Davis teaches the subject matter of Claims 1 and 17 above under 35 USC 103(a).**



**As to Claim 3**, Davis appears to be silent to the trenches and plateau areas, but Chou teaches trenches and plateaus (Fig. 8). It would have been prima facie obvious to one of ordinary skill in the art at the time of the invention to incorporate the method of Chou into that of Davis a) in order to provide a magnetic material adapted for horizontal recording (4:54-64), and b) in order to provide a plurality of discrete elements of magnetic material, and c) because Davis clearly suggests the magnetic materials and method which Chou provides (Davis, par. [0080]). **As to Claim 4**, Chou teaches a substrate (Item 40, Figs. 4A-4D). **As to Claims 5 and 6**, Chou teaches selectively removing the resist film to form a pattern of areas that do not have the resist film thereon (Fig. 4C), and disposing a magnetic layer in the areas that do not have the resist film (Fig. 4D, Item 48).

**Claim 10** is rejected under 35 U.S.C. 103(a) as being unpatentable over Davis (2002/0025408). Davis teaches the subject matter of Claim 1 above under 35 USC 103(a).

**As to Claim 10**, Davis appears to teach that the mold is maintained at its temperature, and thus would appear to be heated first. See [0078] in particular. However, the claimed order of heating represents a rearrangement in the order of steps, which is generally considered to be prima facie obvious in the absence of unexpected results. Here, it would have been prima facie obvious to rearrange the order of steps in order to perform a procuring temperature on the resist ([0066]-[0070]) and to subsequently imprint the preheated resist.

**Claim 7** is rejected under 35 U.S.C. 103(a) as being unpatentable over Davis (2002/0025408) in view of Chou (USPN 5956216), and further in view of Chou (USPN 6309580). Davis and Chou ('216) teach the subject matter of Claim 5 above under 35 USC 103(a).

As to **Claim 7**, Davis and Chou ('216) appear to be silent to the deliberate etching of the base structure using the patterned resist film. However, Chou ('580) teaches that recesses may be formed in the substrate (Fig. 8 and 10:41-51) using a patterned resist film produced by imprinting (Figs. 1A-1D). It would have been prima facie obvious to one of ordinary skill in the art at the time of the invention to incorporate the method of Chou ('580) into that of Davis because Davis suggests application of material into the spaces between the resist, and because doing so would mechanically secure the deposited material into the substrate, rather than to the surface.

**Claim 9** is rejected under 35 U.S.C. 103(a) as being unpatentable over Davis (2002/0025408) in view Colburn (Solid State Technology, Vol. 44, Issue 7, (July 2001), pp. 67-77). Davis teaches the subject matter of Claim 1 above under 35 USC 103(a).

As to **Claim 9**, Davis appears to be silent to the multilayer resist. However, Colburn teaches that bilayer resists are known in nanoimprint lithography (see Fig. 1 and pages 67-68). It would have been prima facie obvious to one of ordinary skill in the art at the time of the invention to incorporate the method of Colburn into that of Davis because many resists are known to be used interchangeably and are substitutable for each other, and the use of Colburn's resist in the Davis process is merely the substitution of one known nanoimprinting resist for another.

**Claims 13-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Davis (2002/0025408). Davis teaches the subject matter of Claim 12 above under 35 USC 103(a).**

**As to Claim 13**, Davis does not explicitly teach the “close proximity”, however, it would have been prima facie obvious to keep the stamper in close proximity to the resist film in order to avoid heat loss during transfer. **As to Claim 14**, Davis appears to be silent to the exact temperatures. However, firstly Davis clearly recognizes that the particular temperatures of the stamper and resist represent result effective variables that the ordinary artisan would have optimized ([0073] and [0074]). See MPEP 2144.05 II and *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). Additionally, Davis suggests that the substrate (and resist) be heated to about 5 C above the glass transition temperature, and that the stamper should be within about 30 C over the glass transition temperature ([0073] and [0075]). **As to Claim 15**, Davis clearly teaches the resist and mold both be heated to a temperature very close to or at the glass transition temperature. **As to Claim 16**, Davis also teaches an embodiment wherein the resist is at a temperature slightly above the glass transition temperature, and the stamper is slightly below the temperature of the resist ([0073] and [0075]).

**Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Davis (2002/0025408) in view Colburn (Solid State Technology, Vol. 44, Issue 7, (July 2001), pp. 67-77). Davis teaches the subject matter of Claim 1 above under 35 USC 103(a).**

**As to Claim 18**, Davis appears to be silent to providing a substrate prior to heating. However, Colburn teaches that a polymeric material may be provided on a substrate, and

embossed, wherein the providing a substrate would obviously occur (Fig. 1) prior to heating. It would have been prima facie obvious to one of ordinary skill in the art at the time of the invention to incorporate the method of Colburn into that of Davis because one would have found the Davis process obviously applicable to patterning resists as well as patterning of polymeric layers in view of Colburn's disclosure of a similar structure and embossing process.

**Claim 19** is rejected under 35 U.S.C. 103(a) as being unpatentable over Davis (2002/0025408) in view of Chou (USPN 5956216). Davis teaches the subject matter of Claim 1 above under 35 USC 103(a).

**As to Claim 19**, Chou teaches selectively etching the resist film to form areas above the base that do not have the resist film thereon (Fig. 4C) and disposing a magnetic layer above the base layer in the areas that do not have the resist film (Fig. 4D). It would have been prima facie obvious to one of ordinary skill in the art at the time of the invention to incorporate the method of Chou into that of Davis because Davis clearly suggests the method for magnetic media ([0052]), which is what Chou provides.

**Claims 23 and 24** are rejected under 35 U.S.C. 103(a) as being unpatentable over Davis (2002/0025408) in view of Chou (USPN 5956216), Chou (USPN 6309580), and Chen (USPN 4786564). Davis, Chou ('216), and Chou ('580) teach the subject matter of Claim 7 above under 35 USC 103(a).

**As to Claim 23**, Chou ('580) teaches removing the resist film (10:3-24) wherein a pattern of raised zones and recessed zones is formed in the base structure, but Davis, Chou ('216) and

Chou ('580) appear to be silent to a continuous layer. However, Chen teaches a continuous layer which is provided as protection for the underlying alloy (7:67-8:7). It would have been prima facie obvious to one of ordinary skill in the art at the time of the invention to incorporate the method of Chen into that of Davis in order to provide a hard layer to protect the delicate magnetic structure. **As to Claim 24**, Davis teaches a thermoset resist ([0053]).

#### **(10) Response to Argument**

##### **Appellant's Argument A: Claims 1, 2, 8, and 25 are not anticipated by Krauss**

Appellant argues that the Krauss method actually uses a step in which the mold and wafer were kept under pressure while the platens cooled and until the temperature dropped below the PMMA glass transition temperature (Br. 8). Appellant further argues that the Examiner relies on what Krauss did not do, and the portion of page 83 (lines 10-12) is properly interpreted as an isolated sidebar comment (Br. 8-9) which fails to teach the other process steps. Additionally, Appellant argues that it is not clear that both the mold and the PMMA coated wafer were heated (Br. 9). To summarize, Appellant appears to be arguing that the disclosure of Krauss relied upon in the rejection is not enabled.

##### **Examiner's Response A: The reference is enabled and prior art for all that it teaches**

It is axiomatic that a reference is prior art for all that it teaches, including nonpreferred embodiments. The fact that a reference discloses a process and then disavows it makes the reference no less anticipatory. In this case, the paragraph bridging pages 82 and 83 of the Krauss

reference discusses imprinting conditions where both the PMMA film and the mold were heated to 175 C, which is above the glass transition temperature. Krauss discloses at page 83 that the mold was pressed against the resist coated wafer and held there for a period of 10 minutes. Krauss next discloses two alternative cooling cycles. In the first, the mold and wafer were kept under pressure until the platens had cooled below the glass transition temperature of the PMMA (Krauss, page 83, lines 8-10). In the second, separation of the mold and PMMA coated wafer before the PMMA had cooled below its glass transition temperature resulted in the PMMA flowing and thus destroying the nanoscale resist patterns (Krauss, page 83, lines 10-12). It is this second alternative relied upon by the rejection. It is further the Examiner's position that both alternative cooling cycles use the same heating and imprinting steps disclosed on pages 82 and 83 for at least the reasons that they are described in the same paragraph and Krauss fails to set forth any different heating and imprinting conditions for the two alternative cooling cycles. Thus, it is not the case, as Applicant asserts, that Krauss fails to disclose the other process steps. In summary, the Examiner submits that the Krauss reference is enabled and discloses two alternative cooling cycles used with the same heating and imprinting conditions.

**Appellant's Argument B: Claims 1-4, 8, 11, 14, 15, 18, and 25 are not anticipated by Tan**

This rejection has been withdrawn.

**Appellant's Argument C: Claims 1-4, 8, 11, 14, 15, 18, and 25 are not obvious over Tan**

This rejection has been withdrawn.

**Appellant's Argument D: Claims 1, 2, 8, and 25 are not obvious over Davis.**

Appellant admits that Davis teaches that the mold temperature can be at, above, or below the glass transition temperature, but asserts that this provides “no specific guidance whatsoever” to one of ordinary skill in the art, and that the most preferred method is to preheat to a temperature below the glass transition temperature (Br. 13). Appellant further admits that Davis teaches that the mold temperature can be maintained, increased, or decreased as necessary to optimize replication and enable substrate release, but that the conditions are three generic alternatives and they are not specifically stated to be done during removal of the substrate from the mold (Br. 13). Appellant further argues that the only specific guideline with respect to temperature at the time of removal is to have the substrate below the glass transition temperature, and that one might need to decrease, increase, or maintain the mold temperature to achieve removal below the glass transition temperature (Br. 13). Appellant further argues that the Office Action is inappropriately reading a timeline into the process (Br. 13-14). Appellants submit that the rejection has improperly cherry-picked alternatives from generic statements while ignoring specific statements which one skilled in the art would rely upon (Br. 14). Appellant is of the position that the Davis disclosure is tantamount to saying that “anything can be done to the substrate temperature after being placed in the mold of any temperature as necessary to enable substrate release from the mold” as justification for deeming such temperatures as result effective variables (Br. 15).

Additionally, Appellant points to a declaration as secondary evidence of nonobviousness. Appellants submit that the declaration fulfills the nexus requirement because it recites what led

to the unexpected result (Br. 15), and there is no basis to infer that because some temperatures worked better than others that this is critical or essential subject matter.

**Examiner's Response D: The claimed invention is obvious over Davis and does not provide an unexpected result.**

The Examiner respectfully disagrees with Appellant's characterization of the reference, and also disagrees that the result is unexpected.

Appellant relies heavily (Br. 13) on a single embodiment of Davis in which the mold is provided at a temperature below the glass transition temperature of the material (Davis, [0076]) and the molded substrate is cooled to below the glass transition temperature prior to removing the mold, however, this single example instead supports the Examiner's position. The invention of Claim 1 does not require any particular stamper temperature, and the only limitation at issue is the recitation that the stamper is separated from the resist film before the resist film is cooled below approximately a glass transition temperature of the resist film (Claim 1, lines 4-5). The instant specification provides no express guidance for interpreting "approximately a glass transition temperature." Appellant's argument also does not appear to consider Davis' teaching that the substrate is cooled by contact with the mold ([0076]) but that "[I]n an especially preferred embodiment, the mold is preferably heated to within a few degrees below the glass transition temperature for crystalline materials..." (Davis, [0073]). Therefore, while Davis does indeed provide an embodiment in which a molded substrate is cooled to below the glass transition temperature (Br. 13), the molded substrate is cooled to that temperature by contact with the mold which is heated at a temperature *only a few degrees below the glass transition*



*temperature of the embossed material in the preferred embodiment.* It is the Examiner's position that when the molded substrate is cooled to the temperature of the mold and separated, it meets the claim language "before the resist film is cooled below approximately a glass transition temperature of the resist film" since the interpretation of "approximately a glass transition temperature" in this case should include at least a few degrees below the glass transition temperature, as disclosed by Davis.

The Examiner asserts that the particular temperatures of the mold and resist or substrate in the Davis process represent result-effective variables that should be optimized in order to (1) optimize replication, (2) enable substrate release from the mold, (3) maintain the integrity of the surface features, and (4) reduce cycle time. Appellant disagrees, and suggests that Davis' teaching is so broad as to be tantamount to saying that "anything can be done to the substrate temperature after being placed in the mold of any temperature" (Br. 15). The Examiner respectfully submits that the Davis disclosure is not unbounded in the manner suggested by Appellant. Davis teaches or suggests that the mold temperature is within about 5-10°C below the glass transition temperature to about 30 °C above the glass transition temperature ([0073]). In an especially preferred embodiment of Davis, the mold or stamper is preferably heated to within a few degrees below the glass transition temperature of the embossable material ([0073]). Expressed another way, Davis' broad disclosure of the mold temperature is bounded in the following way:

$$T_g - 10^{\circ}\text{C} \leq T_{\text{mold}} \leq T_g + 30^{\circ}\text{C}.$$

The substrate (upon which the resist material is coated) is heated to a temperature greater than the glass transition temperature of the material being embossed, which is typically about 5°C or

less above the glass transition temperature or less for crystalline materials, or more for amorphous materials ([0074]). Expressed another way, the temperature of the substrate (and the resist material being embossed) fulfills the following relationship when the material is crystalline:

$$T_g \leq T_{\text{substrate}} \leq T_g + 5^\circ\text{C}.$$

Davis further teaches that “[B]y *maintaining the mold* below or slightly above the glass transition temperature and separately heating the substrate to greater than the glass transition temperature, the embossing cycle time can be reduced by orders of magnitude” ([0078], emphasis added). What Davis appears to be suggesting is that by maintaining the mold at a constant temperature below or slightly above the glass transition temperature, cycle time is reduced by avoiding temperature cycling of the mold. It is respectfully submitted that in view of these portions of the reference, Appellant’s characterization of the reference is not correct. Appellant takes the view that one of ordinary skill in the art would understand a temperature might be “maintained” until a substrate is to be removed because the only statements where Davis is specific to the temperature at removal describe the substrate to be below the glass transition temperature (Br. 14). However, this view is contradicted by paragraphs [0076] and [0078] of Davis. One of the main objectives of these paragraphs of Davis appears to be that one can avoid temperature cycling of the mold – at removal or otherwise – by using mold and substrate temperatures near the glass transition temperature to reduce temperature cycle time. It is not the case that the Examiner is arguing that “anything can be done to the substrate temperature after being placed in the mold of any temperature” as Appellant appears to assert (Br. 15). Davis provides specific guidance with

respect to the mold temperature and the substrate/resist temperature, which constitute result effective variables.

Additionally, Appellant points to the Treves Declaration (filed 31 October 2008) as secondary evidence of nonobviousness. The Treves Declaration states that for small features below a few tenths of a micrometer, shearing distortion disappeared if the mold was opened before cooling (Treves Dec. 3). It is said that that “It was a total surprise that there existed any temperature above the glass transition temperature at which good embossing and separation occurred without incurring reflow upon opening the mold before cooling to below the glass transition temperature.” (Treves Dec. 3). First, the Examiner submits that because Davis teaches mold temperatures and substrate/resist temperatures substantially the same as those claimed, the recognition by Appellant that embossing and separation temperatures substantially the same as those of Davis might resolve some unrecognized shear distortion problems is not sufficient to distinguish the claimed invention. This situation would be similar to the discovery of a previously unappreciated property of a prior art material or process. In this case, similar elimination of shear distortion would be present in the Davis process in view of the similar temperature conditions used. Second, in relying on the Treves statement that “[I]t was a total surprise that there existed any temperature above the glass transition temperature at which good embossing and separation occurred without incurring reflow upon opening the mold before cooling to below the glass transition temperature,” (Treves Dec. 3) Appellant appears to be suggesting that the process, not the result, is unexpected. Appellant's arguments assert that he has discovered an alternate route to a known result (embossed features), but does not demonstrate how this result is unexpected. The declaration appears to concede the issue by

stating that the traditional process used in the prior art (where cooling is performed before separation) worked reasonably well for large features (Treves Dec. 2-3), and it is unclear how the claimed process can be considered an unexpected result where no particular size range is claimed. Third, it is unclear whether there is sufficient actual proof to support the conclusion set forth in the declaration since the figure said to be attached to the declaration (Treves Dec. 3, line 9) is absent, and there is no comparative evidence which compares the result of the claimed temperature conditions to the prior art process which was alleged to lead to severe distortion. Appellant was informed of the absent figure on page 2 of the 22 January 2009 Final Rejection.

In summary, it is submitted that careful consideration of the actual temperature ranges and objectives disclosed by Davis supports the Examiner's position. The Davis disclosure is specific and suggests that the mold temperature and substrate or resist temperature represent result effective variables which would have been obvious as a result of routine experimentation. The Treves Declaration suggests that Appellant has discovered a property or behavior (elimination of shear) already present in the Davis process. Additionally, the declaration is drawn to an allegedly unexpected process, rather than an unexpected result.

#### **(11) Related Proceeding(s) Appendix**

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

/Matthew J. Daniels/

Application/Control Number: 10/659,006

Page 21

Art Unit: 1791

Primary Examiner, Art Unit 1791

Conferees:

/Benjamin L. Utech/

Primary Examiner

/Christina Johnson/

Supervisory Patent Examiner, Art Unit 1791